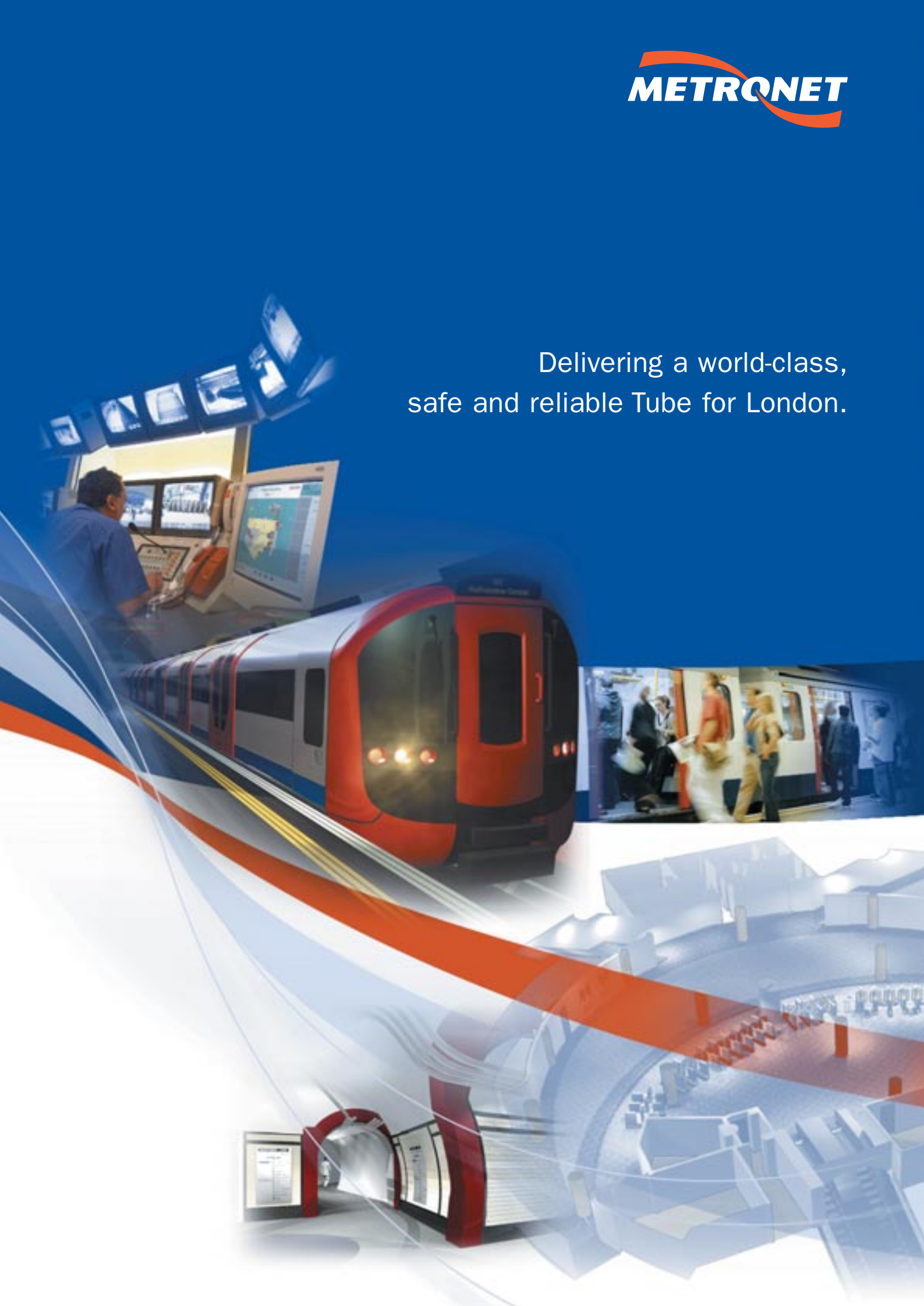
METRONET

Delivering a world-class,
safe and reliable Tube for London.



# 24/7

**The race is on:**
Working in the dead of night with only a four-hour window to complete his job, a track engineer reprofiles the welded joint of a new section of District line track at Hammersmith.

These modern-day craftsmen work with oxy-acetylene equipment to tolerances of just 0.5mm, cutting and replacing sections of rail. They handle more than just flying sparks: the weld material dropped into the rail gap is heated to 3200°C.

So complex is the work that, by the end of his shift, this engineer and his team will have cut and welded only two joins. But with a co-ordinated programme of regular and frequent track work, Metronet is creating the smooth, comfortable and reliable ride Tube travellers expect.

While London sleeps, Metronet is at its busiest, maintaining and repairing track, signals and other assets on the London Underground.

On any night there can be up to 3,000 people carrying out maintenance and renewal activities to ensure the network is returned to safe service in the morning. The work must be meticulously planned and quickly carried out – Metronet has, on average, just four hours from approximately 1am before the trains start running again.

In preparation for that precious time slot, Metronet staff and their contractors must book access to stations and track and agree this with London Underground. Metronet ensures there are no clashes and that all staff are properly trained and certified, have the relevant permits to work, and are able get their equipment to and from the site safely.

Engineering trains must be ready and in place for moving in heavy track and signalling materials. Careful liaison is essential at this time.

Metronet keeps track of all this through an engineering hours performance report. More than 20 efficiency improvement projects have been identified as a result.

Metronet has developed a 'one-stop shop', co-locating Metronet planning and access/protection booking staff with London Underground's track access team.

Back on the track, London Underground line controllers work through the night so that engineering trains safely reach their destination and Metronet duty engineers ensure all London Underground requirements are met.

So, next time you go to sleep, you can rest easy in the knowledge that far below the streets of London and above ground in the open sections, the capital's Tube is in safe hands.

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Developing a world-class, safe and reliable Tube for London.

Metronet, working in partnership with London Underground.

**John Weight**
Executive Chairman

## Introduction

Following years of planning, bidding and discussing, the work to transform London's Underground is now, at last, happening.

While safety is at the top of our agenda – and always will be – we at Metronet are strong advocates of providing a service of which the travelling public will be proud.

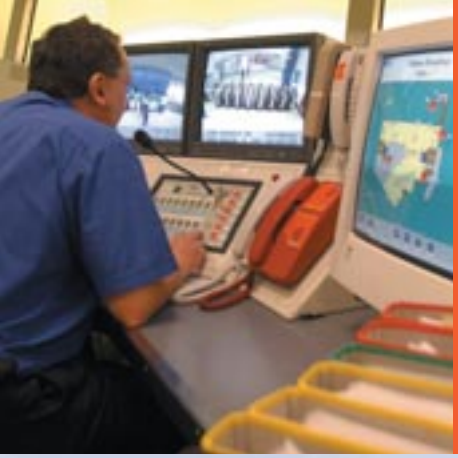
It will not happen overnight, but it will happen. Progressively, with strategic planning and effective execution, there will be recognition of the improvements we are all working to deliver. A lot of that work will take place out of sight, more often in the middle of the night and at weekends, carried out by teams of dedicated staff.

Metronet vows to work with London Underground and Transport for London to ensure everything is done to keep disruption to a minimum during essential work and to conduct the necessary changes to bring about real and significant improvements to the Tube system as quickly as possible.

Initially we are targeting improvements in areas which cause most disruption to the service. We plan the early replacement of those components we identify, the condition of which has the worst effect on existing performance. With Metronet's sound financial backing, such improvements will be put in place quickly, while at the same time planning the longer-term route upgrades which will give much needed increases in system capacity and reliability.

Metronet and our partners are honoured to have been given this opportunity to help develop a safer, faster, cleaner and more reliable Tube. We will deliver.

John Weight
Executive Chairman



Metronet is spending over £2.5 million each working day for the first 7.5 years.

Metronet's management and staff focus on safety and performance.

Investing in new trains, track and signalling and a comprehensive modernisation and refurbishment of the capital's stations.

Metronet's head office at Templar House, Holborn, London.

## Metronet

Metronet is a consortium of five world-class companies. Under the 30-year Public Private Partnership (PPP) contract, it is responsible for upgrading, replacing and maintaining two-thirds of London Underground's infrastructure – its trains, stations, signalling, track, tunnels and bridges.

The consortium was established in June 1999 with Atkins, Balfour Beatty, Bombardier Transportation, EDF Energy and RWE Thames Water each holding equal shares. These companies bring together an unrivalled expertise in project management and planning, railway engineering and asset management supported by a wide range of technical disciplines.

Metronet developed successful bids to operate two of the three infrastructure companies, now renamed Metronet Rail BCV Limited (MRBCV) and Metronet Rail SSL Limited (MRSSL). MRBCV maintains and upgrades the Bakerloo, Central, Victoria and Waterloo & City lines, which are 'deep Tube' lines running far below the streets of London.

MRSSL maintains and upgrades the Metropolitan, District, Circle, Hammersmith & City and East London lines, collectively known as the sub-surface lines. The Tube Lines consortium manages JNP (the Jubilee, Northern and Piccadilly lines). Metronet became a live operational business at the beginning of April 2003.

Metronet plans to spend over £2.5 million each working day for the first 7.5 years to breathe new life into London's Underground network, investing in new trains, track and signalling. The capital's stations will also be modernised or refurbished. Metronet brings a passion for service, a commitment to a faster, safer, cleaner and more reliable system and a determination to support London Underground in delivering a welcoming, integrated service for the capital.

Bombardier Transportation has the contract for supplying the new trains and signalling, Balfour Beatty the majority of the track replacement work and Trans4m the civil engineering work and refurbishment and modernisation of the stations. Trans4m – a dedicated contract management organisation formed by Balfour Beatty, RWE Thames Water, Atkins and EDF Energy – does this by working in alliance with Metronet.

Metronet is a consortium of five world-class partners bringing together a wealth of experience in project management, planning, railway engineering and asset management supported by a wide range of technical disciplines.

## The Consortium

**Atkins** is one of the world's leading providers of professional, technologically-based consultancy and support services. It already undertakes significant consultancy work for London Underground and is the UK's leading railway engineering business with expertise in safety, design, electrification and signalling.

**Balfour Beatty** is one of the largest engineering, construction and asset management groups in the United Kingdom. It employs 26,000 people and is strongly orientated towards the engineering, financing, construction, maintenance and asset management of infrastructure. It carries out over £600 million of work per annum for railway customers, making it the largest contracting and service business for fixed railway infrastructure in the United Kingdom.

**Bombardier Transportation** is the global leader in the rail equipment manufacturing and servicing industry. Its wide range of products includes passenger rail vehicles and turnkey rail project delivery. It also manufactures locomotives, freight cars, propulsion and controls and provides rail control solutions. With its headquarters in Montréal, Canada, Bombardier Transportation has a workforce of 36,000 people and has manufacturing facilities in 24 countries. Bombardier Transportation is an operating division of Bombardier Inc., a diversified manufacturing and service company and world-leading manufacturer of business jets and regional aircraft.

**EDF Energy** is the new name for SEEBOARD, which changed its name to better reflect its position as one of the UK's leading energy companies. SEEBOARD became a member of the former LE Group in July 2002. EDF Energy is responsible for the electricity distribution networks in London, the South-East and the East of England and supplies energy to more than five million customers nationwide. SEEBOARD Powerlink, owned by EDF Energy, Balfour Beatty and ABB, has the 30-year contract to operate, maintain, finance and renew London Underground's high-voltage power distribution network.

**RWE Thames Water** is a global specialist in water and wastewater operations and services. Worldwide, it serves a population of about 54 million people, including 13 million customers in London and the Thames Valley. The company is one of the capital's largest and most experienced infra-structure managers, investing £500 million in major capital investments and operating a major network of pipes and sewers beneath the city's congested streets. This includes the Thames Water Ring Main, one of the largest tunnelling projects undertaken in London since the Tube was first built. RWE Thames Water has been leading a multi-agency initiative to tackle rising groundwater levels in the capital, which has included working with London Underground.

The PPP contractual structure provides London Underground with trains, stations and the related infrastructure.

Metronet does not own the assets, London Underground retains ownership.

Metronet is delivering the challenging programme of investment in stations and civil assets.

## The PPP Service Contract

In March 1998 the Government announced its plans to secure long-term, sustained levels of investment, vital to deliver the network London needs, through the development and implementation of a 30-year Public Private Partnership, the PPP.

Under the PPP, London Underground has overall responsibility to deliver services to the travelling customer and for overall safety of the Underground systems. Each infrastructure company – MRBCV, MRSSL and Tube Lines – has entered into a service contract with London Underground for the provision of infrastructure services.

The PPP Service Contract is the central document in the PPP contractual structure, under which the relevant Metronet company agrees to provide the infrastructure services required. Metronet has to provide London Underground with trains, stations and related infrastructure to the standards and performance levels required in order to provide the public with a reliable service over the network in a safe, efficient and economic manner.

For this London Underground pays the Metronet companies, through the infrastructure service charge (ISC), a four-weekly regular payment which is increased or reduced to reflect the company's actual performance. The payment is subject to annual indexation.

MRBCV and MRSSL can improve their revenues if their performance for capability, ambience and availability exceeds the benchmarks included in the service contract. Revenue is reduced if performance falls below the benchmark measures and, as an additional incentive for the company to perform, the deductions suffered for poor performance are generally at twice the rate of the increase in revenue for improved performance.

The statutory Safety Case is held by London Underground and overall safety responsibility remains in the public sector.

London Underground retains responsibility for passenger service provision, including control and operation of trains and stations.

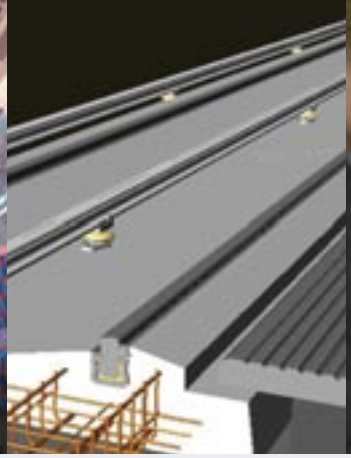
Metronet is responsible for the safe maintenance, reliability and cleanliness of trains and stations.

## Working in Partnership

While Metronet and Tube Lines have the task of regenerating the entire Tube network, London Underground retains the responsibility for passenger service provision, including control and operation of trains and stations and responsibility for collecting and retaining all fares and other revenues.

**Specifically:**

- The assets of London Underground have been leased to Metronet and Tube Lines
- Train operations remain with London Underground in the public sector and it continues to retain responsibility for running the railway
- Metronet and Tube Lines are responsible for the maintenance, reliability and cleanliness of London Underground's assets
- The statutory Safety Case is held by London Underground and consequently overall safety responsibility remains in the public sector
- The wheel-rail interface remains under the control of a single management
- Track and signalling maintenance continues to be carried out by Metronet and Tube Lines' directly-employed staff, many of the same people that historically carried out this function within London Underground
- For the next 30 years, Metronet and Tube Lines are investing some £1 billion per year on new trains, new track, new signalling and refurbished and modernised stations



Metronet Rail BCV and Metronet Rail SSL have each been structured into two operational units – maintenance and major capital works.

The asset management system, known as Ellipse, will deliver efficiencies and improvements in maintenance and investments.

## The Metronet Companies

Members of the Metronet consortium, through companies within their respective groups, are each 20 per cent share-holders in both Metronet Rail BCV Holdings Limited and Metronet Rail SSL Holdings Limited, which on financial close, acquired the relevant infrastructure companies.

MRBCV and MRSSL have separate contracts because, in order to protect LU's rights, Metronet is required to keep the two organisations separate. However, the two companies work closely together to ensure that synergies are optimised.

Metronet is committed to creating two world-class asset management businesses that deliver their obligations as asset stewards through informed and effective decision making.

To fulfil their obligations under the PPP Service Contracts, MRBCV and MRSSL have each been structured into two main operational units – maintenance and major capital works.

Maintenance work is principally carried out by the company itself. Major capital works to renew and upgrade infrastructure and its capacity is carried out under contracts designed to reflect Metronet's obligations under the service contract. Each Metronet company is responsible for supervising works and co-ordinating them with its activities so that disruption to services is minimised while renewals programmes progress.

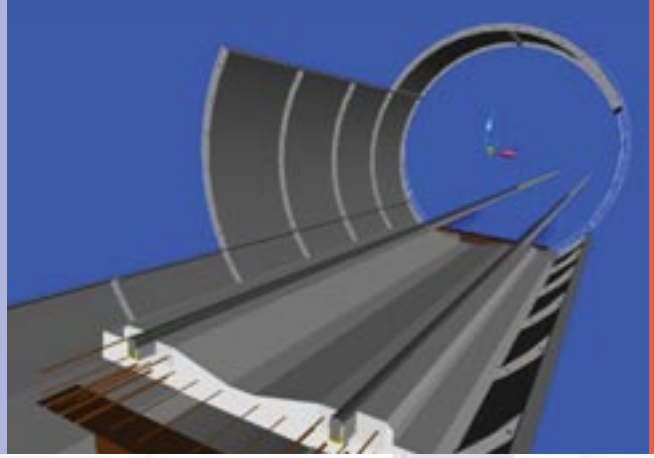
The scope of the work is immense. In the first 7.5 year term of the contract, Metronet will be spending around £7 billion on Metronet Rail BCV and Metronet Rail SSL, with similar levels of investment planned for the subsequent term of the contract.

## The Scarce Resource Alliance

Some units providing specialist services could not be sensibly divided under PPP. Consequently, Metronet manages two-thirds of these and serves other Underground companies under contract. Metronet groups these units together under the Scarce Resource Alliance (SRA).

The SRA comprises the Train Maintenance Unit (the railway equivalent of a body shop), the Railway Engineering Workshop (which refurbishes components such as wheel sets and motors), TrackForce (a dedicated team skilled in all aspects of track replacement) and the Track Workshops (which can recreate a section of track ready for installation the same night). In addition, Infrastructure Logistics manages signals, track and lifts and escalator materials, while Telecoms has technicians to maintain and troubleshoot station communication equipment.

Trans4m delivers Metronet's station modernisation and refurbishment programme in addition to the civil asset work.



Trans4m operates in alliance with Metronet.

Metronet is required to maintain in a safe condition all assets, including all tunnels, embankments and bridges.

## Trans4m

The delivery of Metronet's £1.9 billion investment programme in stations and civil assets is entrusted to Trans4m, a dedicated contract management organisation formed from four of the five Metronet shareholders, Atkins, Balfour Beatty, EDF Energy and RWE Thames Water.

Trans4m will regenerate the London Underground network using the knowledge of new technology and pioneering techniques from each of its four shareholders in conjunction with Metronet's experience of combining different aspects of a railway into one integrated system.

Trans4m works in alliance with Metronet, encouraging close co-operation across the supply chain and instilling a partnership spirit.

## Civils

Metronet is required, over a 7.5 year period, to inspect and maintain in safe condition all assets, which include tunnels, embankments and bridges. It must also assess the condition of assets, the state of which is unknown.

The scope of the civil works covers:

- Inspection
- Assessment
- Planned maintenance
- Improvement and repair works
- Track/civil interface works (MRSSL only)

This relates to assets worth £8.5 billion including:

- 806 bridges
- 2,000-plus structures
- 77.5 miles of deep Tube tunnels
- 103 miles of earth structures
- 77.5 miles of track drainage and associated pumps

Necessary long-range work in the deep Tube tunnel sections will be carried out in the second 7.5 year period.

## Asset Management

Metronet is investing some £15 million in Ellipse – an integrated asset management system that will introduce consistent ways of working across the Metronet companies. The four key components of Ellipse are asset management, finance, materials and procurement, and human resources. Ellipse will provide a single asset register with an inventory of all the assets maintained, their condition and the costs associated with their maintenance.

This will enable improved asset performance and business decision making, ultimately leading to improved safety, performance, availability, customer satisfaction and value for money. This significant two-year business change programme will be completed in July 2005.

By 2012, a station modernisation and refurbishment programme will be completed, including improved security and passenger information.

There will be improved system maintenance through replacement of obsolete systems by modern technology.

## Stations

By 2012, a station modernisation and refurbishment programme will be completed, including improved security and passenger information and a reduction of congestion at specific locations.

Metronet is also conducting an enhanced cleaning regime for stations, having completed an initial 'deep clean'.

**Specifically:**

- 63 stations on the MRBCV network will be modernised or refurbished, with three more to be agreed with London Underground
- 84 stations on the MRSSL network will be modernised or refurbished

**Metronet is:**

- Introducing an electronic station management system on all modernised stations
- Providing high quality PA systems in all areas, electronic information displays in ticket halls and on platforms and providing available service and next train information
- Installing better located, improved and clearer signage, improved lighting and more reliable lifts and escalators, reducing the likelihood of station closures due to failed equipment and systems
- Removing graffiti from stations within 24 hours and introducing an intensive litter-picking regime

As part of this work, Metronet will replace or refurbish 30 lifts and 66 escalators.

## Signalling

Sub-contractors Westinghouse Rail Systems will carry out the signalling upgrade. It already has considerable experience designing and supplying signalling solutions to London Underground.

The new systems to be introduced as part of the line upgrades on the Victoria line and sub-surface lines will include:

- New 'Distance to Go' ATP signalling system, allowing trains to run faster, closer together
- Well-proven, high integrity solid-state interlocking systems, providing extremely safe and reliable control
- Improved signalling control, with automatic train regulation and decision support facilities to better co-ordinate services and speed service disruption recovery
- Automatic train operation, for more predictable and controllable train operations
- The replacement of insulated block joints with a more reliable system of jointless track circuits plus a more efficient maintenance programme resulting from the replacement of pneumatic point motors and – in MRSSL only – train stops

Metronet is introducing improved track installation, monitoring and maintenance using Ultrasonic Rail Flaw Detection.

A Land Rover converted to run on rails is set to check rails for cracks using ultrasound. Ultimately, inspections will be carried out using a Tube train.

## Track

Metronet is undertaking major track and signalling renewal in the first 15 years, in the first half of which 127.5 miles of track will be renewed and 166 points and crossings will be replaced. This will restore the track condition to required benchmarks and remove many speed restrictions.

Altogether, 407 weekends will be used over the 7.5 year period (128 for MRBCV, 279 for MRSSL), with up to 80 weekend projects taking place in each of years five and six.

- Within MRBCV, 65 miles of track along with 66 sets of points and crossings will be renewed during weekends and overnight during engineering hours – the four hours at night when no passenger trains are running. By the end of the first 7.5 years, almost 40 per cent of the main line will have been replaced at a cost of £479 million.

- Within MRSSL, 62.5 miles of track will be renewed and 100 sets of points and crossings will be replaced over weekend periods during the first 7.5 years. It will replace 90 per cent of its track by 2018.

The majority of this extensive track work has been contracted to Balfour Beatty Rail Projects, which will review track renewal priorities and methodologies to implement best practice industry techniques. This will be used to improve renewals planning and to target maintenance. The remaining work will be performed by TrackForce, the in-house contracting organisation of MRBCV.

In addition, Metronet is introducing improved track installation, monitoring and maintenance by using Ultrasonic Rail Flaw Detection (URFD) to minimise the occurrence of broken rails.

The ability to undertake works with existing labour resources is aided by logistics and supply chain management and experience of planning work in limited timeframes of a live railway. Balfour Beatty Rail Projects was the first railway infrastructure contractor to gain ISO14001 status.

Metronet is committed to increasing the number of trains available for service from 2004 with more still in 2005.

A major repair under way at the Train Maintenance Unit which is capable of modifying trains and repairing damaged coach bodies.

There is a single fault reporting centre for each Metronet company.

## Improving Trains and Train Services

Metronet is replacing interior panels and lighting on its fleets. The upgrade programme for the District line trains is targeted at the seat condition, grab poles, interior glass and arm rests.

There will be an annual 'deep clean' on trains; there is already better exterior train washing. Metronet is also using reliability-centred maintenance techniques to optimise the prescribed rolling stock maintenance cycle.

Determined to allow London Underground to make the most of the existing fleets, Metronet has already increased the number of trains available for service on the Central line and will do so again in 2005. There will also be more trains on the Bakerloo and Victoria lines in 2005.

**Highlights in the first 7.5 years:**

- **The Central line**, under Metronet, will have seven extra trains available for peak service by 1 April 2005 – a 10 per cent improvement in service levels to London Underground. Off-peak, 65 trains will be available. Metronet is investing £68 million in an 18-month heavy overhaul programme of the entire Central line fleet.

- **The Waterloo & City line** will have a 25 per cent improvement in service by 2007 through the introduction of an additional train. Safety 'rollback protection' is being provided in 2004/5 and, in later years, faster run-times through improved track geometry.

- **The District line** fleet began a four-year upgrade programme in spring 2004 by Bombardier Transportation. The 75 six-car trains were being fitted with new interiors including improvements to the drivers' cabs, as well as being re-painted. The first refurbished train was due to enter service in winter 2004.

- **The Victoria line** was due to have two more trains in summer 2004 with three more promised by the following year. Journey times will be four per cent better by 2005 and reliability 19 per cent improved by 2006.

- **The Bakerloo line** fleet is being given a £1.4 million 'deep clean' complete with new seating and an extra train in 2005.

**Repair and maintenance**

Modern maintenance and cleaning facilities will be established to support the introduction of the new MRSSL train fleet. There is also a single fault reporting centre for each Metronet company.

These support the development of reliability-centred maintenance techniques, improved monitoring and targeted maintenance, resulting in improvements to the overall performance of the train service.

New trains, in conjunction with new signalling, will enable vastly improved journey times. The first new trains arrive on the Victoria and Metropolitan lines in 2009.

New trains for MRSSL will feature air conditioning and interconnecting gangways allowing passengers to walk through the entire train.

## New Trains

Metronet awarded the rolling stock contract to Bombardier Transportation prior to financial close in April 2003. The new trains will be manufactured at its plant in Derby.

The first of a fleet of 47 new eight-car trains will enter service on the Victoria line in 2009. Once production begins, a new train will be manufactured every 15 working days and the entire upgrade will be completed by August 2012. The Bakerloo line will also have a new fleet of 42 seven-car trains by 2019.

The sub-surface lines will receive 190 air-conditioned new trains in the first 12 years of the contract. This will replace and enlarge the existing fleets on the Metropolitan, Circle, Hammersmith & City and District lines. The MRSSL trains will feature inter-connecting gangways allowing passengers to walk through the entire train, the length of which will change to suit the different lines.

All new trains in the MRSSL fleet will be to the same design, bringing time-cost advantages to maintenance regimes and the procurement of replacement parts. The new trains, in conjunction with new signalling, will enable vastly improved journey times. The first new train will enter service on the Metropolitan line in 2009 with others following at the rate of one every 10 days. 72 will be running on the Metropolitan line by 2013, 78 on the District line by June 2015 and 40 on the Circle and Hammersmith & City lines by 2013.

**New MRSSL rolling stock will bring improvements such as:**

- Improved ventilation, lighting and ride quality for passengers
- Wide doors with stand-back areas and carefully designed interiors to improve boarding and alighting
- Energy-efficient, highly reliable solid-state propulsion systems
- Excellent performance as a result of all axles being motored, leading to faster journey times
- Extremely strong, crash-resistant vehicle structures
- Significant reliability improvement over existing rolling stock, based on a proven vehicle product platform
- Vehicles designed for easier maintenance to ensure minimum downtime and lower maintenance costs
- Hard-wearing, vandal-resistant materials and finishes to provide long-lasting exterior and interior environments
- Spacious, air-conditioned and ergonomically designed cabs for drivers

£17 billion will be invested during the 30 year contract. £7 billion in the first 7.5 year period.

## Metronet Commitments

**Line by line, station by station, the fold-out Tube map opposite shows key improvements Metronet will deliver under the PPP contract. In all, 150 stations will be modernised or refurbished by the years shown, many of them with better lifts, escalators and accessibility for the mobility impaired. In addition, Metronet promises:**

- £17 billion invested during the 30-year contract – £7 billion in the first 7.5 years
- 150 stations modernised or refurbished by 2012; 11 stations by end of 2005; another 32 by end of 2006
- 127.5 miles of new track; 166 points and crossings renewed in the first 7.5 years
- Comprehensive upgrade of all civils assets – 806 bridges, 2,000-plus structures, 77.5 miles of tunnels, 103 miles of embankments and cuttings and 77.5 miles of track drainage – all in the first 15 years

### Bakerloo line

- Line upgrade and 42 new trains by 2019, the first in 2017
- 18 per cent improvement in asset availability by 2005
- £1.4 million 'deep clean' of entire fleet
- 4 miles of new track by 2011

### Central line

- Seven extra trains available for peak service by 1 April 2005 – a 10 per cent improvement
- £68 million 18-month heavy overhaul of entire fleet
- 300 per cent improvement in reliability of rolling stock
- 43 miles of new track by 2011

### Victoria line

- 47 new trains – the first entering service in 2009 with protoypes running from 2006
- New signalling systems
- 19 per cent improvement in asset availability by 2006
- 4 per cent improvement in journey times by 2005
- 15 miles of new track by 2011

### Waterloo & City line

- All five trains available for use in rush hour by 2007
- 25 per cent increase in rush hour capacity
- Faster run-times through improved track geometry
- 2.6 miles of new track by 2011

### Circle line

- 40 new trains by 2013, the first in 2012 (shared with Hammersmith & City line)
- New signalling system by 2013
- New track through work on other sub-surface lines

### District line

- Multi-million pound refurbishment of existing trains
- 78 new trains by June 2015, the first in 2013
- Complete upgrade of signalling and control systems by 2016
- 21 miles of new track by 2011

### Metropolitan line

- 72 new trains to enter service between 2009 and 2013
- New signalling system by 2013
- 39 miles of new track by 2011 (3 miles shared with Waterloo & City line)

### Hammersmith & City line

- 40 new trains by 2013, the first in 2012 (shared with Circle line)
- New signalling system by 2013
- 4 miles of new track (3 miles shared with Metropolitan line)

### East London line

- A separate project exists outside Metronet to extend the line north to Dalston and Highbury and Islington and south to connect with suburban routes to Wimbledon and West Croydon.

Designed by CRA Design Ltd, London

## What's my line?

### Bakerloo line

Opened 1906 as Baker Street and Waterloo Railway, nickname 'Bakerloo' adopted four months later. Now 14.5 miles long with 25 stations – Oxford Circus is the busiest, handling 38.6 million people a year. Carries 104 million passengers a year. **Trains:** 1972 seven-car Mark Two tube stock, manufactured by Metro-Cammell. Depots: Stonebridge Park, London Road (near Elephant & Castle) and Queen's Park.

### Central line

Opened 1900 and known as "Twopenny Tube" for its flat fare. Extended west in 1908 for White City Exhibition, and east in 1912 to Liverpool Street. Now longest (46 miles) of the network, serving 49 stations as far apart as West Ruislip and Epping. Carries 199 million passengers a year. **Trains:** Eight-car '1992 Stock', manufactured by Adtranz. Depots: West Ruislip, Hainault and White City.

### Victoria line

Opened 1968-1971. First deep-level line built across central London since Tube boom of 1905-1907. Links Walthamstow, north-east, with Brixton, south. Covers 13.25 miles, serving 16 stations. Carries 175 million passengers a year. **Trains:** Eight-car '1967 stock', manufactured by Metro-Cammell, refurbished 1991-1995. Depot: Northumberland Park.

### Waterloo & City line

Opened 1898. 1.5 miles long. Links Waterloo with Bank. Carries 10.5 million passengers a year, mostly City of London commuters. Known affectionately as 'The Drain'. **Trains:** Five four-car '1992 Stock', manufactured by Adtranz.

### Circle line

Created from District, Hammersmith & City and Metropolitan lines and completed in 1884. Only two short sections of 14.5-mile route used solely by Circle line trains. Serves 27 stations and London's main line termini. Carries 74 million passengers a year. **Trains:** Six-car 'C stock', manufactured by Metro-Cammell in 1969 and 1977; refurbished 1991-1994. Depot: Hammersmith.

### District line

Opened 1868, now has termini at Ealing Broadway, Richmond, Wimbledon, Kensignton (Olympia), Edgware Road and Upminster. Its 40 miles serves 60 stations, handling up to 64 train movements an hour. Carries 188 million passengers a year. **Trains:** Six-car 'D stock', built by Metro-Cammell and entering service from 1979-83; also 'C stock' Circle Line trains to Edgware Road due to short platforms. Depots: Ealing Common and Upminster.

### Metropolitan line

World's first underground, opened Paddington-Farringdon 1863. 41.5 mile, 34 station route, from Aldgate in heart of the City to Amersham deep in the Chilterns and includes branches to Chesham, Uxbridge and Watford. Carries 58 million passengers a year. **Trains:** Eight-car 'A stock' manufactured by Cravens 1960 and 1962; refurbished 1994-1997. Depot: Neasden.

### Hammersmith & City line

Opened in 1864 as an extension of Metropolitan Railway to Hammersmith. Extended to Whitechapel in 1884. Nine miles long with 19 stations (plus extension to Barking). Carries 50 million passengers a year. **Trains:** Six-car 'C stock', manufactured by Metro-Cammell 1969 and 1977; refurbished 1991-1994. Depots: Hammersmith and Edgware Road.

### East London line

Opened 1869 as conversion of Sir Marc Brunel's historic twin pedestrian tunnels under the River Thames. Further links and extensions in 1876 and 1880. Canada Water opened in 1999 as interchange with Jubilee Line extension. Five miles long, serving nine stations between Shoreditch and New Cross or New Cross Gate. Carries 11.3 million passengers a year. **Trains:** Four-car 'A stock', manufactured by Cravens 1960-62.

# Metronet Rail Map and Station Modernisation Programme

| Metronet Rail BCV | Metronet Rail SSL | Other lines |
|---|---|---|
| Bakerloo | Circle | Other lines |
| Central | District | East London line* |
| Victoria | Metropolitan | |
| Waterloo & City | Hammersmith & City | |

*East London line will be transferred to the Strategic Rail Authority in the future.

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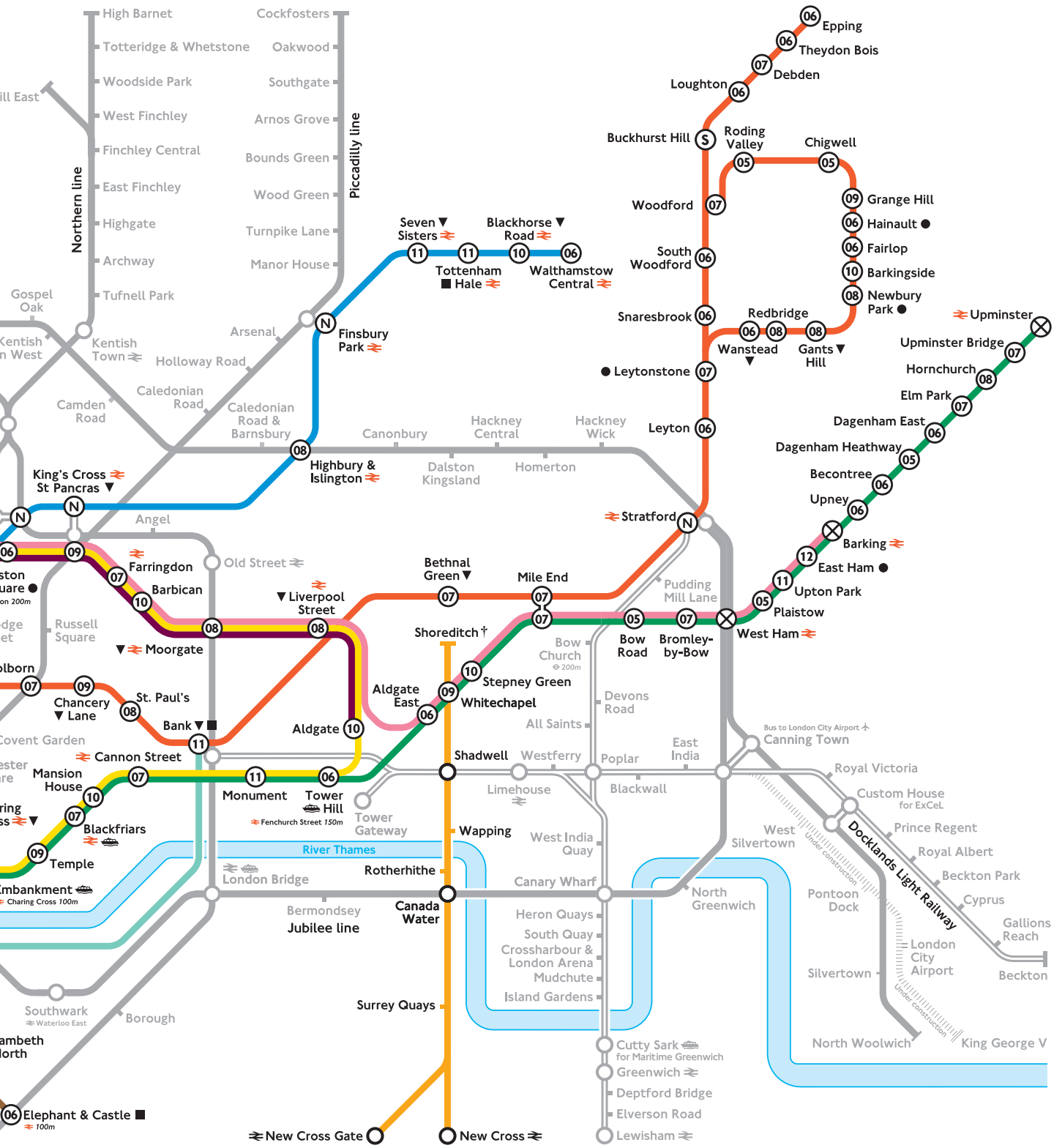


**Modernisation Key**

- (06) Station modernisation or refurbishment including year of completion
- ⊗ Not part of Metronet's modernisation plans
- (N) Not currently part of Metronet's responsibility
- (S) Special project - scope and delivery date yet to be determined
- ■ Lift modernisation
- ▼ Escalator modernisation
- ● Station accessibility projects

METRONET UNDERGROUND

Working in Partnership

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